DOCUMENT RESUME

ED 197 140 CE 027 768

AUTHOR Osland, Walt
TITLE Mountain Plains Learning Experience Guide: Automotive Repair. Course: Automotive Shop Safety.
INSTITUTION Mountain-Plains Education and Economic Development Program, Inc., Glasgow AFB, Mont.
SPONS AGENCY Office of Vocational and Adult Education (ED), Washington, D.C.
BUREAU NO 498MH90008
PUB DATE Mar 76
CONTRACT 300-79-0153
NOTE 59p.: For related documents, see CE 027 766, CE 027 769-775, CE 027 777-780.

EDRS PRICE MF01/PC03 Plus Postage.
DESCRIPTORS *Accident Prevention: Adult Education: *Auto Mechanics: Disadvantaged: Family Programs: *Individualized Instruction: Instructional Materials: Learning Activities: Learning Modules: Motor Vehicles: Postsecondary Education: *Safety: Safety Education: Skilled Occupations: *Vocational Education
IDENTIFIERS Mountain Plains Program

ABSTRACT

One of twelve individualized courses included in an automotive repair curriculum, this course presents avoidance of dangerous situations and accidents, and emergency equipment and procedures. The course is comprised of one unit, Shop Safety. The unit begins with a Unit Learning Experience Guide that gives directions for unit completion. The remainder of the unit consists of Learning Activity Packages (LAP) that provide specific information for completion of a learning activity. Each LAP is comprised of the following parts: objective, evaluation procedure, resources, procedure, supplemental sheets, study guide, and a LAP test with answers. The course is preceded by a pretest which is designed to direct the student to units and performance activities. (LRA)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

ED197140

MOUNTAIN PLAINS LEARNING EXPERIENCE GUIDE:

Automotive Repair.

Course: Automotive Shop Safety.

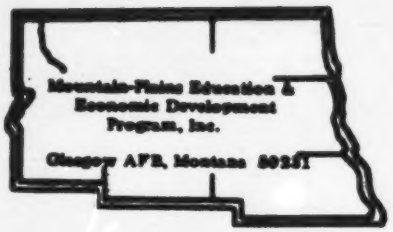
CE 027 768

U S DEPARTMENT OF HEALTH, EDUCATION & WELFARE
NATIONAL INSTITUTE OF EDUCATION

THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL NATIONAL INSTITUTE OF EDUCATION POSITION OR POLICY

File Code: 37.01.00.00. B1-1

Date Published: 3/4/76



Learning Experience Guide

COURSE: AUTOMOTIVE SHOP SAFETY

DESCRIPTION:

Automotive Shop Safety includes the dangers and accidents that can be avoided, safety procedures, and safety equipment in the Automotive Shop area.

RATIONALE:

This course is a basis for all other courses within Automotive. The course presents avoidance of dangerous situations and accidents, and emergency equipment and procedures.

PREREQUISITES:

None

OBJECTIVES:

Recognize and use safety equipment, accident prevention techniques and safety procedures involved with automobile repair and servicing.

RESOURCES:

A resource list is attached.

GENERAL INSTRUCTIONS:

This course has one unit. The unit has a Unit Learning Experience Guide (LEG) that gives directions for unit completion. The unit consists of Learning Activity Packages (LAPs) that provide specific information for completion of a learning activity. Pretesting results direct the student to units and performance activities.

The general procedure for this course is as follows:

(1) Read the assigned unit LEG for this course.
(2) Begin and complete the first assigned LAP.
    a. Take and score the LAP test.
    b. Turn in the LAP test answer sheet.
    c. Determine the reason for any missed items on the LAP test.

Principal Author(s):

W. Osland

GENERAL INSTRUCTIONS: (cont.)

d. Proceed to the next assigned LAP in the unit.
3. Complete all required LAPs for the unit by following steps (a) through (d).

(3) Take the unit tests as described in the Unit LEG "Evaluation Procedures".
(4) Proceed to the next assigned unit in this course.
(5) Follow steps 1 through 4 for all required units for this course.
(6) Proceed to the next assigned course.

You will work independently unless directed to do otherwise. When questions or problems arise, you are expected to discuss them with the instructor. At all times remember to follow correct safety procedures during the performance activity.

UNIT TITLE:

37.01.01 Shop Safety

EVALUATION PROCEDURE:

Course evaluation is by pre and post testing using a multiple-choice type of test.

In this course, the course test is used as a pretest to determine which units, if any, the student may be able to validate. The student is considered validated for a particular unit if 4 out of 5 items are correctly answered for each LAP part on the course pretest and that particular unit does not have a performance test requirement.

For those units with performance test requirements, the student must also satisfactorily complete the performance test to validate that unit. Unit performance test validation procedures are given in the "Evaluation Procedure" section of the unit Learning Experience Guide (LEG).

The course test will also be taken by the student as a post test to determine any changes resulting from taking all or part of the course. Score 80% correct answers on the course post test.

FOLLOW-THROUGH:

Go to the first unit Learning Experience Guide (LEG) listed on your Student Progress Record (SPR).

RESOURCE LIST

Printed Materials

1. Auto Mechanics Fundamentals. Martin W. Stockel, Goodheart-Willcox Company, Inc.
2. Auto Service and Repair. Martin W. Stockel, Goodheart-Willcox Company, Inc.
3. First Aid Guide for U.S.D.A. Employees. Agriculture Handbook No. 227, 1962.

Audio/Visuals

none

Equipment

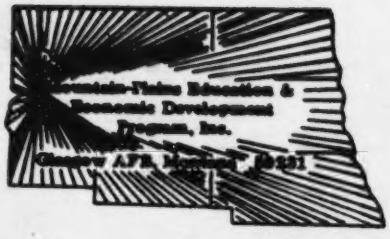
1. Exhaust hose.
2. Fire blanket.
3. Fire extinguishers.
4. First aid kit.
5. Gloves.
6. Goggles.
7. Jack stands.

7/15/75

37.01.00.00 B1-2
37.01.01.00 B1-2

Student: _____ File Code: _____

Date: _____ Date Published: 3/4/76



COURSE/UNIT PRETEST: AUTOMOTIVE SHOP SAFETY

37.01.01.01

1. When an observer notices a person utilizing a grinding machine without goggles, the observer should:

   a. walk up beside and inform the person of the eye protection rule.
   b. come near enough to the worker and carefully remind him of the rule.
   c. ignore the situation because he may endanger his own eyes if he comes near the worker.
   d. report the situation to the supervisor when he meets the supervisor again rather than endanger himself in reminding the worker.

2. When a small fire occurs, the observer should:

   a. report the fire to the supervisor.
   b. utilize a fire extinguisher and have an assistant report the fire.
   c. warn everyone quickly and evacuate the building.
   d. clear the fire area and call the fire department.

3. Smoking is restricted to one area:

   a. because of the fire hazard materials utilized in the shop.
   b. to prevent ashes from entering cleaned precision components.
   c. to prevent smoking workers from interferring with other workers.
   d. in order to properly keep a fire (if started) confined to one area.

4. Exit signs are:

   a. all located over the doors to insure quick exit of the building in emergencies.
   b. utilized only where there exists a good possibility of a fire.
   c. necessary for proper identification of building doors.
   d. necessary to facilitate easier exits of a building when leaving.

5. Standing near an engine being over-revved is dangerous because of:

   a. the backfiring possibility of the carburetor.
   b. the fan blade flying off possibility.
   c. the gear-engagement possibility of the transmission.
   d. the cooling system leak possibility causing hot coolant to spray about.

37.01.01.02

6. Dislodging of a difficult bolt should be done with a:

   a. vice-grip.
   b. twelve-point socket.
   c. open-end wrench.
   d. six-point socket.

7. To protect the worker from possible flying pieces off the striking end of the chisel, the striking end must be:

   a. ground off flat.
   b. chamfered.
   c. rounded off.
   d. cut-off and tempered.

8. A worker operating a drill press or a drill should:

   a. not have any loose clothing.
   b. not operate the drill without a safety observer.
   c. wear gloves to protect his hands.
   d. contact the supervisor for approval.

9. The "crescent wrench" (or adjustable wrench) has one main disadvantage which is that:

   a. the jaws become warped easily under stress.
   b. it can only be used in one position.
   c. it is prone to loosening and slipping.
   d. it is not easily adjusted to size.

10. To prevent jamming a reamer (causing injury or damage) it is recommended to take small cuts at a time. According to Chapter 1 (Basic Hand Tools) in your textbook (Stockel, Auto Service and Repair) you should take small cuts of:

    a. .015-.020
    b. .0001-.0002
    c. .006-.006
    d. .001-.002

37.01.01.03

11. When an artery is cut, the symptoms are:

    a. bright red blood and spurts or wells up.
    b. dark red blood and oozes.
    c. dark red blood and spurts.
    d. bright red blood and oozes.

12. The first step for treatment of a puncture wound is to:

    a. discourage bleeding.
    b. encourage bleeding by mild pressure at edge of wound.
    c. wash with soap and water and apply pressure to stop bleeding.
    d. cover with bandage right away.

13. In treating stomach wounds you should never:

    a. give him water to drink.
    b. keep victim warm, and on back.
    c. clean wound.
    d. raise knees.

37.01.01.04

14. Failure to replace shop equipment in its proper place will cause:

    a. loss of time to locate necessary equipment when needed.
    b. loss of valuable work space due to scattered equipment.
    c. both a and b above.
    d. extensive damage to equipment.

15. Overhead equipment poses an unexpected danger because:

    a. the equipment may fall on someone or something.
    b. a worker often doesn't watch what is overhead as he walks.
    c. it may not be designed to suspend over a long period of time.
    d. none of the above.

COURSE/UNIT PRETEST ANSWER KEY: SHOP SAFETY

Occupational Area: AUTOMOTIVE
File Code: 37.01.00.00. B1-2
Name: SHOP SAFETY

ANSWERS

37.01.01.01	1.	B	21.		41.	
	2.	D	22.		42.	
	3.	A	23.		43.	
	4.	A	24.		44.	
	5.	B	25.		45.	
02	6.	D	26.		46.	
	7.	B	27.		47.	
	8.	A	28.		48.	
	9.	A	29.		49.	
	10.	D	30.		50.	
03	11.	C	31.		51.	
	12.	B	32.		52.	
	13.	A	33.		53.	
04	14.	C	34.		54.	
	15.	B	35.		55.	
	16.		36.		56.	
	17.		37.		57.	
	18.		38.		58.	
	19.		39.		59.	
	20.		40.		60.	

Student: _____ File Code: 37.01.01.00.A2-2

Date: _____ Date Published: 2/28/77

UNIT TEST: AUTOMOTIVE SHOP SAFETY (A)

1. For extra hand protection, a wooden handle is usually installed on a file part called the:

   a. heel
   b. tip
   c. edge
   d. tang

2. Before changing drill bits in an electric drill:

   a. the electric power cord should be disconnected.
   b. the operator should secure the drill unit safely on a bench.
   c. the drill activator lock-button should be double checked.
   d. the operator should be away from wet surfaces.

3. Some electrically operated grinders have a wire brush in place of the grinding wheel. This grinder is considered highly dangerous because of:

   a. the danger of jamming the part being buffed into the wire wheel.
   b. the wire needles that can fly off the wheel.
   c. the flying dirt particles that come off the cleaned parts.
   d. all of the above.

4. Using a screwdriver on a unit held in your hand can be considered dangerous because of the:

   a. possibility of dropping the unit and damaging it unnecessarily.
   b. possibility of slipping and making a screwdriver-shaped hole in the hand.
   c. units' sharp edges that may pierce the hand when pressure is applied.
   d. unsteadiness of the hand to effectively control the screwdriver.

5. Hand wrenches should be "pulled" instead of "pushed":

   a. to prevent unnecessary bolt-head damage.
   b. to use the wrench correctly because of its designed strength.
   c. to prevent hand injury if the wrench slips.
   d. because there is more strength application in this position.

6. Using oil on a twist drill:

   a. will slow the cutting but increases drill bit life.
   b. is for cooling only.
   c. will make cutting easier and lengthen drill life.
   d. is not necessary on the newer type drills.

7. Dislodging of difficult bolts should be done with a:

   a. vice-grip.
   b. twelve-point socket.
   c. open-end wrench.
   d. six-point socket.

8. The adjustable wrench has one main disadvantage which is that:

   a. the jaws become warped easily under stress.
   b. it can only be used in one position.
   c. it is liable to loosen and slip.
   d. it is not easily adjusted to size.

9. When installing a new stone on a power grinder make certain:

   a. it has the same grit rating as the old stones.
   b. it is designed to rotate in the proper direction.
   c. it has the proper balance weight for the ginder.
   d. it is designed for the RPM of the grinder.

10. Any dangerous conditions in the shop must be reported to the instructor.

   a. when convenient.
   b. at once.
   c. at close of class.
   d. after school.

11. Oily rags and waste must be put in:

   a. a wooden box.
   b. a closed metal container.
   c. a wastebasket.
   d. a covered cardboard box.

12. Spilled oil and grease is dangerous. You should always:

   a. clean it up.
   b. leave it.
   c. pour water on it.
   d. tell others not to walk on it.

13. Gasoline, paints, solvents, and other materials that will burn are never to be used near:

   a. another student.
   b. an open flame.
   c. a workbench.
   d. a wooden building.

14. Caution another student if you see a violation of:

    a. good manners.
    b. proper grammer.
    c. safety practices.
    d. proper posture.

15. When working with hand or power tools, all loose fitting and ragged clothing and loose jewelry must be:

    a. left on.
    b. hidden.
    c. removed.
    d. adjusted.

16. Vise handles and control knobs are to be tightened by:

    a. hand.
    b. a hammer.
    c. a wrench.
    d. a pry bar.

17. When using a chisel you should:

    a. hold the work in your hands.
    b. hold the work in a vise or clamp.
    c. get a friend to hold it.
    d. get the instructor to hold it.

18. Before using a hammer, check the:

    a. tang and body.
    b. face.
    c. head and handle.
    d. shank.

19. Chips, shavings, and scraps are cleaned from benches and machinery with:

    a. a rag.
    b. a paper towel.
    c. an air hose.
    d. a brush.

20. Before a student operates a machine he must receive:

    a. material
    b. passing grade.
    c. instructions and permission.
    d. instructions.

21. All floors, aisles, and passageways are to be clear of:

    a. instructors and students.
    b. stock, tools, and materials.
    c. tools only.
    d. materials and teachers.

22. Electrical fires should be extinguished:

    a. soda acid
    b. water.
    c. carbon dioxide.
    d. a blanket.

23. Gasoline fires are extinguished with:

    a. soda acid.
    b. water.
    c. CO_2
    d. a wet blarket.

24. Nails, tacks and other non-digestable materials are:

    a. sometimes handy in the mouth.
    b. very dangerous to work with.
    c. never placed in the mouth is an acceptable practice.

25. Before touching electrical switches:

    a. feet and hands are to be wet.
    b. feet and hands are to always be dry.
    c. hands are to be dry.
    d. none of the above.

26. Eye glasses (a) can, (b) cannot be substituted for face-shields.

27. A stream of compressed air must never come in direct contact with your:

    a. eyes.
    b. eyes and skin.
    c. clothes.
    d. other peoples shoes.

28. Whenever possible the motion involved in striking objects or cutting materials is:

    a. towards yourself.
    b. away from yourself.
    c. downwards.
    d. upwards.

29. Machines may be operated only by a student who has passed his safety test, is knowledgeable in its operation, and has received the permission from:

    a. maintenance dept.
    b. automotive aide.
    c. another student.
    d. the instructor.

30. Whenever any major adjustments are done on a machine, have the job checked by the:

    a. the instructor.
    b. maintenance dept.
    c. automotive aide.
    d. another student.

31. Before using drills or bits, they must be checked for:

    a. trade name.
    b. sharpness and size.
    c. hardness.
    d. rounded shank.

32. Always unplug electric drills (motor) when:

    a. changing drills.
    b. tightening chuck.
    c. both of the above.

33. Screwdrivers are designed to:

    a. chisel.
    b. pry.
    c. drive screws.
    d. center punch.

34. When working in the shop on revolving equipment, all jewelry, gloves, and loose clothing must be:

    a. left on.
    b. removed.
    c. hidden.
    d. thrown away.

35. No adjustments, removal of work, or cleaning must be done while any machine is:

    a. being repaired.
    b. in motion.
    c. dirty.
    d. stopped.

36. When the device you are working with catches in the drill while the drill press is in operation, you must:

a. turn the power off.
b. leave it running.
c. remove chuck key.
d. hold it with your hand.

37. Before turning on the drill, be sure:

a. you have a good hold on the stock.
b. the chuck key is removed.
c. other students see you.

38. When using the buffer, you must wear:

a. regular eye glasses.
b. coveralls.
c. face shield.
d. no eye protection.

39. Before jacking up a car with a floor jack, you must first:

a. check the jack.
b. check the tires.
c. block the wheels.
d. release the brakes and be sure transmission is in neutral.

40. Set the jack so that the head lifts a part of the car that is:

a. round.
b. concaved.
c. solid and rigid.
d. at an angle.

41. Safety stands must be placed under a rigid part of the car. The jack _____ be removed before getting under the car.

a. must.
b. must not.
c. may.

42. All lifting devices must be given frequent:

a. use.
b. lubrication.
c. safety checks.
d. washings.

43. Lift the load slightly, then check to make sure that the slings have been correctly:

a. tightened.
b. placed.
c. stretched.
d. placed and tightened.

44. Before raising a car on a lift, always have the pads:

a. in contact at proper lift points.
b. lift where ever they touch the car.
c. checked by a friend.
d. as close to the center line of the car as possible.

45. Wash battery acid from your hands or face immediately. Use plenty of:

a. acid.
b. oil.
c. soap.
d. water.

46. When connecting battery terminal cables, the positive cable terminal should always be connected:

a. first.
b. last
c. doesn't matter.

47. Don't syphon gasoline from a container by mouth:

a. for at least 10 minutes after smoking.
b. if the gasoline is leaded.
c. ever.

48. When removing the battery from a car, to prevent injury or damage from a grounding wrench or other tool:

a. remove the negative cable first.
b. remove the positive cable first.

49. To clean automotive mechanical parts, use:

a. unleaded gasoline.
b. commercial non-flammable solvent.
c. kerosene.
d. naphtha.

50. Oil should not be used on oxy-acetylene welding equipment because:

a. oil contaminates acetylene and lowers efficiency.
b. fittings can be over tightened and damaged.
c. it is flammable and ignites readily.
d. the welding surfaces will be contaminated.

51. The least important function of the air cleaner is:

a. to improve overall engine performance and appearance.
b. filter the air to the carburetor and engine.
c. to function as flame arrestor during back-fire.
d. silence intake air.

52. Mushroomed chisels and punches should be ground with a chamferred edge to:

a. improve appearance.
b. make the tool easier to hold.
c. prevent chunks of metal from flying.
d. increase strength to tool.

53. Keep sparks and flame away from batteries because:

a. the case may melt.
b. hydrogen and oxygen gases form a highly explosive combination.
c. you may void the warranty.
d. heat makes the acid more corrosive.

54. Generally, for automotive work, the safest and best wrench for hex nuts and bolts is the:

a. six point box end wrench.
b. adjustable end wrench.
c. vise grip pliers.
d. open end wrench.

55. The most mistreated tool in the shop is the:

a. box end wrench.
b. file.
c. adjustable wrench.
d. screwdriver.

56. When grinding off the mushroom or sharpening a chisel you should let it get hot to preserve the temper.

a. true.
b. false.

57. Do not try to reharden a punch or chisel because it may become brittle enough to shatter when struck with a hammer.

a. true.
b. false.

58. A sharp chisel is more dangerous to use than a dull one:

a. true
b. false

59. When drilling sheetmetal you should:

a. stand clear so that when the bit "catches" the whirling metal piece will not cause injury.
b. securely clamp the piece

60. When working under a car, safety stands:

a. may not be necessary if you have inspected the jack and know it is safe.
b. must always be used.
c. are not necessary when merely making a quick adjustment or inspection.

61. Most grinding accidents are caused by:

a. improper mounting or use of grinder.
b. careless handling.
c. using the wrong wheel.
d. all the above

62. The work rest on a grinder should be placed within _____ inch from the wheel.

a. 1
b. 1/2
c. .020
d. 1/8

63. Carbon monoxide:

a. is a poisinous gas recognizable by its strong odor.
b. is dangerous because it reduces the oxygen carrying capacity of the blood.
c. is a tasteless, odorless, colorless gas referred to as "laughing gas".
d. is dangerous because it causes burning of the eyes.

64. The cleaning solvent that would be the least toxic for cleaning parts is:

a. carbon tetrachloride.
b. trichloroethylene.
c. stoddard solvent.
d. methylene chloride.

65. The main disadvantage of using gasoline as a cleaning solvent is:

a. its high cost.
b. the lead it contains.
c. its flammability.
d. the cleaned part is left too dry.

66. You prime an engine by:

a. pouring gasoline from an open pan into the car.
b. running gasoline into the carburetor with a syphone hose.
c. pouring a small amount of gasoline into the carburetor from an enclosed container before the engine is cranked.
d. pouring a small quantity of gasoline into the carburetor from an enclosed container while cranking the engine.

67. The most noticeable neglect of the transmission jack is the:

a. failure to clean the jack of spilt fluid.
b. damage incurred by banging the jack into place.
c. abuse of lifting too heavy objects.
d. none of the above.

68. The adjustable extension legs of the portable crane should be:

a. lengthened as far as possible.
b. lengthened out evenly.
c. adjusted with the top arm legthened further.
d. must be kept within one notch of each other.

69. To safely and effectively lift the front end of an average car, a jack should be used with a minumum rating of:

a. 2 ton.
b. 1/2 ton.
c. 5 ton.
d. 1 ton.

70. Of all uncleaned hand tools, the one which will have the most ill effect upon itself is:

a. sockets.
b. a speed handle.
c. a ratchet.
d. box-end wrenches.

71. Coolant temperature often reaches 260^0 or more. Removing the radiator cap at this time:

a. may show a high coolant level.
b. could permit a small amount of coolant to be lost.
c. may allow coolant to flash (boil) and form a geyser at the radiator filler neck.
d. may allow air to enter the system and cause corrosion.

72. The gasoline tank:

a. should be repaired with the electric welder rather than gas to avoid an open flame.
b. should never be exposed to sparks, heat or open flames.
c. can be safely repaired with either arc or gas welding as long as proper eye protection is used.

73. When an observer notices a person without goggles utilizing a grinding machine, the observer should:

a. walk up beside and inform the person of the eye protecton rule.
b. come near enough to the worker and carefully remind him of the rule.
c. ignore the situation because he may endanger his own eyes if he comes near the worker.
d. report the situation to the supervisor when he meets the supervisor again rather than endanger himself in reminding the worker.

74. The most hazardous gas that usually build up in the shop is:

a. unburned hydro-carbons.
b. carbon dioxide.
c. carbon monoxide.
d. NO_x (oxides of nitrogen)

75. When a small fire occurs, the observer should:

a. report the fire to the supervisor.
b. utilize a fire extinguisher and have an assistant report the fire.
c. warn everyone quickly and evacuate the building.
d. clear the fire area and call the fire department.

76. Exit signs are:

a. all located over the doors to insure quick exit of the building in emergencies.
b. utilize only where there exists a good possibility of a fire.
c. necessary to facilitate easier exits of a building when leaving.

77. Twist drills are sharpened to the same cutting angle for all metals:

a. true.
b. false.

78. A single or double post frame lift requires that the left pads be:

a. adjusted to match the frame.
b. adjusted to lift the center of the vehicle.
c. adjusted to lift the body evenly.
d. none of the above.

79. When lifting the car with a hoist:

a. lifting saddles must be properly located and in positive contact.
b. once saddles are located, apply some pressure, stop and examine them again before lifting the car.
c. watch for any side or overhead obstruction.
d. all of the above.

COURSE/UNIT POST TEST ANSWER KEY: SHOP SAFETY

Occupational Area: AUTOMOTIVE
File Code: 37.01.00.00. C1-2 A
Name: AUTOMOTIVE SHOP SAFETY
Family Pay Number: _____ Sex: M F (Circle 1)

ANSWERS

37.01.01.01	1.	C	21.		41.		
	2.	D	22.		42.		
	3.	B	23.		43.		
	4.	C	24.		44.		
	5.	D	25.		45.		
02	6.	D	26.		46.		
	7.	B	27.		47.		
	8.	D	28.		48.		
	9.	D	29.		49.		
	10.	C or D	30.		50.		
03	11.	C	31.		51.		
	12.	B	32.		52.		
	13.	A	33.		53.		
04	14.	C	34.		54.		
	15.	B	35.		55.		
	16.		36.		56.		
	17.		37.		57.		
	18.		38.		58.		
	19.		39.		59.		
	20.		40.		60.		

Student: _____ File Code: 37.01.01.00.C1-2(B)

Date: _____ Date Published: 6-6-77

COURSE/UNIT POST TEST: AUTOMOTIVE SHOP SAFETY (B)

37.01.01.01

1. Driving vehicles in and out of a crowded shop should be:

   a. done only by the owner.
   b. postponed until there exists more adequate space.
   c. done only by the supervisor.
   d. done with the assistance of another to prevent unnecessary damage.

2. Priming of an engine carburetor should be done only:

   a. by a covered container while the engine is turning slowly.
   b. with the engine still.
   c. by careful application and then standing back before starting engine.
   d. under the close supervision of the instructor.

3. Standing near an engine being over-revved is dangerous because of:

   a. the backfiring possibility of the carburetor.
   b. the fan blade flying off possibility.
   c. the gear engagement possibility of the transmission.
   d. the cooling system leak possibility causing hot coolant to spray about.

4. Falls within the shop are most commonly due to:

   a. blocked walkways.
   b. running.
   c. improper lighting.
   d. spilt fluids.

5. Spilt fluids on the floor should be:

   a. immediately rinsed off with water.
   b. covered with floor dry compound soon.
   c. wiped up immediately.
   d. reported to the night shop custodian station.

37.01.01.02

6. It is recommended to hold a chisel firmly but not too tightly because:

   a. the hammer impact on the chisel will be partially absorbed by the hand lessening the effectiveness of the chisel.
   b. none of these.
   c. over tension will cover the holding hand to be unsteady, therefore making it difficult to strike the end squarely.
   d. if the hammer head hits the fingers, it will cause serious injury.

37.01.01.02 (continued)

7. To prevent jamming a reamer (causing injury or damage) it is recommended to take small cuts at a time of:

   a. .015-.020
   b. .0001-.0002
   c. .005-.006
   d. .001-.002

8. When "pushing" a wrench is the only way to apply needed force:

   a. it's recommended to push with a closed palm.
   b. it's recommended to wear a protective leather glove on the applying hand.
   c. it's recommended to place a protective mat behind the wrench.
   d. it's recommended to push with the palm open.

9. To protect the worker from possible flying pieces off the striking end of the chisel, the striking end must be:

   a. ground off flat.
   b. chamfered.
   c. rounded off.
   d. cut-off and tempered.

10. Dislodging of a difficult bolt should be done with a:

   a. vice-grip.
   b. twelve-point socket.
   c. open-end wrench.
   d. six-point socket.

37.01.01.03

11. In treating abdominal wounds you should never:

   a. give him water to drink.
   b. keep victim warm, and on back.
   c. clean wound.
   d. raise knees.

12. The first step for treatment of a puncture wound is to:

   a. discourage bleeding.
   b. encourage bleeding by mild pressure at edge of wound.
   c. wash with soap and water and apply pressure to stop bleeding.
   d. cover with bandage right away.

13. In case of nose bleed have victim sit with head back, breathing through mouth, and clothing at neck loosened, then you:

   a. pack gauze into nostril.
   b. blow nose.
   c. press nostril continuously in the middle portion for 5 to 10 minutes.
   d. take to doctor.

37.01.01.04

14. Crushing cigarettes out on the floor is unacceptable because:

    a. they cause a walking hazard.
    b. it may ignite fumes lying on the floor.
    c. it presents an untidy appearance of the work shop.
    d. the laws require smokers to use cigarette butt receptacles at all times.

15. A worker may sprinkle floor dry compound on spilt fluids and:

    a. may leave the compound until the end of the work day.
    b. may leave the compound until he is completed with his job and then remove it.
    c. should work the compound into the fluid and then sweep it up immediately.
    d. may leave the compound on the fluid until it fully absorbs the fluid whether it takes a full day or more.

COURSE/UNIT POST TEST ANSWER KEY: AUTOMOTIVE SHOP SAFETY (B)

1. D
2. C
3. B
4. D
5. C
6. C
7. D
8. D
9. B
10. D
11. A
12. B
13. C
14. B
15. C

COURSE/UNIT POST TEST: AUTOMOTIVE SHOP SAFETY (C)

37.01.01.01

1. Priming of an engine carburetor should be done only:

   a. by a covered container while the engine is turning slowly.
   b. with the engine still.
   c. by careful application and then standing back before starting engine.
   d. under the close supervision of the instructor.

2. Driving vehicles in and out of a crowded shop should be:

   a. done only by the owner.
   b. postponed until there exists more adequate space.
   c. done only by the supervisor.
   d. done with the assistance of another to prevent unnecessary damage.

3. Falls within the shop are most commonly due to:

   a. blocked walkways.
   b. running.
   c. improper lighting.
   d. spilled fluids.

4. Spilled fluids on the floor should be:

   a. immediately rinsed off with water.
   b. covered with floor dry compound soon.
   c. wiped up immediately.
   d. reported to the night shop custodian station.

5. Standing near an engine being over-revved is dangerous because of:

   a. the backfiring possibility of the carburetor.
   b. the fan blade flying off possibility.
   c. the gear engagement possibility of the transmission.
   d. the cooling system leak possibility causing hot coolant to spray about.

37.01.01.02

6. When "pushing" a wrench is the only way to apply needed force:

   a. it's recommended to push with a closed palm.
   b. it's recommended to wear a protective leather glove on the applying hand.
   c. it's recommended to place a protective mat behind the wrench.
   d. it's recommended to push with the palm open.

37.01.01.02 (continued)

7. Disloding of a difficult bolt should be done with a:

   a. vice-grip.
   b. twelve-point socket.
   c. open-end wrench.
   d. six-point socket.

8. It is recommended to hold a chisel firmly but not too tightly because:

   a. the hammer impact on the chisel will be partially absorbed by the hand lessening the effectiveness of the chisel.
   b. none ot these.
   c. over tension will cover the holding hand to be unsteady, therefore making it difficult to strike the end squarely.
   d. if the hammer head hits the fingers it will cause serious injury.

9. To protect the worker from possible flying pieces off the striking end of the chisel, the striking end must be:

   a. ground off flat.
   b. chamfered.
   c. rounded off.
   d. cut-off and tempered.

10. To prevent jamming a reamer (causing injury or damage) it is recommended to take small cuts at a time of:

   a. .015-.020
   b. .0001-.0002
   c. .005-.006
   d. .001-.002

37.01.01.03

11. The first step for treatment of a puncture wound is to:

   a. discourage bleeding.
   b. encourage bleeding by mild pressure at edge of wound.
   c. wash with soap and water and apply pressure to stop bleeding.
   d. cover with bandage right away.

12. In case of nose bleed have victim sit with head back, breathing though mouth, and clothing at neck loosened, then you:

   a. pack gauze into nostril.
   b. blow nose.
   c. press nostril continuously in the middle portion for 5 to 10 minutes.
   d. take to doctor.

37.01.01.03 (continued)

13. In treating abdominal wounds you should never:

    a. give him water to drink.
    b. keep victim warm, and on back.
    c. clean wound.
    d. raise knees.

37.01.01.04

14. A worker may sprinkle floor dry coumpound on spilled fluids and:

    a. may leave the compound until the end of the work day.
    b. may leave the compound until he is completed with his job and then remove it.
    c. should work the compound into the fluid and then sweep it up immediately.
    d. may leave the compound on the fluid until it fully absorbs the fluid whether it takes a full day or more.

15. Crushing cigarettes out on the floor is unacceptable because:

    a. they cause a walking hazard.
    b. it may ignite fumes lying on the floor.
    c. it presents an untidy appearance of the work shop.
    d. the laws require smokers to use cigarette butt receptacles at all times.

COURSE/UNIT POST TEST ANSWER KEY: AUTOMOTIVE SHOP SAFETY (C)

1. C
2. D
3. D
4. C
5. B
6. D
7. D
8. C
9. B
10. D
11. B
12. C
13. A
14. C
15. B

UNIT TEST ANSWER SHEET

Occupational Area: Automotive
File Code: 37.01.00 (C)
Name:
Family Pay Number: Sex: M F (Circle 1)

ANSWERS

0101	1. C	21.		41.	
	2. D	22.		42.	
	3. D	23.		43.	
	4. C	24.		44.	
	5. B	25.		45.	
0102	6. D	26.		46.	
	7. D	27.		47.	
	8. C	28.		48.	
	9. B	29.		49.	
	10. D	30.		50.	
0103	11. B	31.		51.	
	12. C	32.		52.	
	13. A	33.		53.	
0104	14. C	34.		54.	
	15. B	35.		55.	
	16.	36.		56.	
	17.	37.		57.	
	18.	38.		58.	
	19.	39.		59.	
	20.	40.		60.	

7. Dislodging of difficult bolts should be done with a:

   a. vice-grip.
   b. twelve-point socket.
   c. open-end wrench.
   d. six-point socket.

8. The adjustable wrench has one main disadvantage which is that:

   a. the jaws become warped easily under stress.
   b. it can only be used in one position.
   c. it is liable to loosen and slip.
   d. it is not easily adjusted to size.

9. When installing a new stone on a power grinder make certain:

   a. it has the same grit rating as the old stones.
   b. it is designed to rotate in the proper direction.
   c. it has the proper balance weight for the ginder.
   d. it is designed for the RPM of the grinder.

10. Any dangerous conditions in the shop must be reported to the instructor.

   a. when convenient.
   b. at once.
   c. at close of class.
   d. after school.

11. Oily rags and waste must be put in:

   a. a wooden box.
   b. a closed metal container.
   c. a wastebasket.
   d. a covered cardboard box.

12. Spilled oil and grease is dangerous. You should always:

   a. clean it up.
   b. leave it.
   c. pour water on it.
   d. tell others not to walk on it.

13. Gasoline, paints, solvents, and other materials that will burn are never to be used near:

   a. another student.
   b. an open flame.
   c. a workbench.
   d. a wooden building.

14. Caution another student if you see a violation of:

    a. good manners.
    b. proper grammer.
    c. safety practices.
    d. proper posture.

15. When working with hand or power tools, all loose fitting and ragged clothing and loose jewelry must be:

    a. left on.
    b. hidden.
    c. removed.
    d. adjusted.

16. Vise handles and control knobs are to be tightened by:

    a. hand.
    b. a hammer.
    c. a wrench.
    d. a pry bar.

17. When using a chisel you should:

    a. hold the work in your hands.
    b. hold the work in a vise or clamp.
    c. get a friend to hold it.
    d. get the instructor to hold it.

18. Before using a hammer, check the:

    a. tang and body.
    b. face.
    c. head and handle.
    d. shank.

19. Chips, shavings, and scraps are cleaned from benches and machinery with:

    a. a rag.
    b. a paper towel.
    c. an air hose.
    d. a brush.

20. Before a student operates a machine he must receive:

    a. material
    b. passing grade.
    c. instructions and permission.
    d. instructions.

21. All floors, aisles, and passageways are to be clear of:

    a. instructors and students.
    b. stock, tools, and materials.
    c. tools only.
    d. materials and teachers.

22. Electrical fires should be extinguished:

    a. soda acid
    b. water.
    c. carbon dioxide.
    d. a blanket.

23. Gasoline fires are extinguished with:

    a. soda acid.
    b. water.
    c. CO_2
    d. a wet blanket.

24. Nails, tacks and other non-digestable materials are:

    a. sometimes handy in the mouth.
    b. very dangerous to work with.
    c. never placed in the mouth is an acceptable practice.

25. Before touching electrical switches:

    a. feet and hands are to be wet.
    b. feet and hands are to always be dry.
    c. hands are to be dry.
    d. none of the above.

26. Eye glasses (a) can, (b) cannot be substituted for face-shields.

27. A stream of compressed air must never come in direct contact with your:

    a. eyes.
    b. eyes and skin.
    c. clothes.
    d. other peoples shoes.

28. Whenever possible the motion involved in striking objects or cutting materials is:

    a. towards yourself.
    b. away from yourself.
    c. downwards.
    d. upwards.

29. Machines may be operated only by a student who has passed his safety test, is knowledgeable in its operation, and has received the permission from:

    a. maintenance dept.
    b. automotive aide.
    c. another student.
    d. the instructor.

30. Whenever any major adjustments are done on a machine, have the job checked by the:

    a. the instructor.
    b. maintenance dept.
    c. automotive aide.
    d. another student.

31. Before using drills or bits, they must be checked for:

    a. trade name.
    b. sharpness and size.
    c. hardness.
    d. rounded shank.

32. Always unplug electric drills (motor) when:

    a. changing drills.
    b. tightening chuck.
    c. both of the above.

33. Screwdrivers are designed to:

    a. chisel.
    b. pry.
    c. drive screws.
    d. center punch.

34. When working in the shop on revolving equipment, all jewelry, gloves, and loose clothing must be:

    a. left on.
    b. removed.
    c. hidden.
    d. thrown away.

35. No adjustments, removal of work, or cleaning must be done while any machine is:

    a. being repaired.
    b. in motion.
    c. dirty.
    d. stopped.

36. When the device you are working with catches in the drill while the drill press is in operation, you must:

a. turn the power off.
b. leave it running.
c. remove chuck key.
d. hold it with your hand.

37. Before turning on the drill, be sure:

a. you have a good hold on the stock.
b. the chuck key is removed.
c. other students see you.

38. When using the buffer, you must wear:

a. regular eye glasses.
b. coveralls.
c. face shield.
d. no eye protection.

39. Before jacking up a car with a floor jack, you must first:

a. check the jack.
b. check the tires.
c. block the wheels.
d. release the brakes and be sure transmission is in neutral.

40. Set the jack so that the head lifts a part of the car that is:

a. round.
b. concaved.
c. solid and rigid.
d. at an angle.

41. Safety stands must be placed under a rigid part of the car. The jack _____ be removed before getting under the car.

a. must.
b. must not.
c. may.

42. All lifting devices must be given frequent:

a. use.
b. lubrication.
c. safety checks.
d. washings.

43. Lift the load slightly, then check to make sure that the slings have been correctly:

a. tightened.
b. placed.
c. stretched.
d. placed and tightened.

44. Before raising a car on a lift, always have the pads:

    a. in contact at proper lift points.
    b. lift where ever they touch the car.
    c. checked by a friend.
    d. as close to the center line of the car as possible.

45. Wash battery acid from your hands or face immediately. Use plenty of:

    a. acid.
    b. oil.
    c. soap.
    d. water.

46. When connecting battery terminal cables, the positive cable terminal should always be connected:

    a. first.
    b. last
    c. doesn't matter.

47. Don't syphon gasoline from a container by mouth:

    a. for at least 10 minutes after smoking.
    b. if the gasoline is leaded.
    c. ever.

48. When removing the battery from a car, to prevent injury or damage from a grounding wrench or other tool:

    a. remove the negative cable first.
    b. remove the positive cable first.

49. To clean automotive mechanical parts, use:

    a. unleaded gasoline.
    b. commercial non-flammable solvent.
    c. kerosene.
    d. naphtha.

50. Oil should not be used on oxy-acetylene welding equipment because:

    a. oil contaminates acetylene and lowers efficiency.
    b. fittings can be over tightened and damaged.
    c. it is flammable and ignites readily.
    d. the welding surfaces will be contaminated.

51. The least important function of the air cleaner is:

    a. to improve overall engine performance and appearance.
    b. filter the air to the carburetor and engine.
    c. to function as flame arrestor during back-fire.
    d. silence intake air.

52. Mushroomed chisels and punches should be ground with a chamferred edge to:

a. improve appearance.
b. make the tool easier to hold.
c. prevent chunks of metal from flying.
d. increase strength to tool.

53. Keep sparks and flame away from batteries because:

a. the case may melt.
b. hydrogen and oxygen gases form a highly explosive combination.
c. you may void the warranty.
d. heat makes the acid more corrosive.

54. Generally, for automotive work, the safest and best wrench for hex nuts and bolts is the:

a. six point box end wrench.
b. adjustable end wrench.
c. vise grip pliers.
d. open end wrench.

55. The most mistreated tool in the shop is the:

a. box end wrench.
b. file.
c. adjustable wrench.
d. screwdriver.

56. When grinding off the mushroom or sharpening a chisel you should let it get hot to preserve the temper.

a. true.
b. false.

57. Do not try to rehardon a punch or chisel because it may become brittle enough to shatter when struck with a hammer.

a. true.
b. false.

58. A sharp chisel is more dangerous to use than a dull one:

a. true
b. false

59. When drilling sheetmetal you should:

a. stand clear so that when the bit "catches" the whirling metal piece will not cause injury.
b. securely clamp the piece.

60. When working under a car, safety stands:

a. may not be necessary if you have inspected the jack and know it is safe.
b. must always be used.
c. are not necessary when merely making a quick adjustment or inspection.

61. Most grinding accidents are caused by:

a. improper mounting or use of grinder.
b. careless handling.
c. using the wrong wheel.
d. all the above

62. The work rest on a grinder should be placed within _____ inch from the wheel.

a. 1
b. 1/2
c. .020
d. 1/8

63. Carbon monoxide:

a. is a poisinous gas recognizable by its strong odor.
b. is dangerous because it reduces the oxygen carrying capacity of the blood.
c. is a tasteless, odorless, colorless gas referred to as "laughing gas".
d. is dangerous because it causes burning of the eyes.

64. The cleaning solvent that would be the least toxic for cleaning parts is:

a. carbon tetrachloride.
b. trichloroethylene.
c. stoddard solvent.
d. methylene chloride.

65. The main disadvantage of using gasoline as a cleaning solvent is:

a. its high cost.
b. the lead it contains.
c. its flammability.
d. the cleaned part is left too dry.

66. You prime an engine by:

a. pouring gasoline from an open pan into the car.
b. running gasoline into the carburetor with a syphone hose.
c. pouring a small amount of gasoline into the carburetor from an enclosed container before the engine is cranked.
d. pouring a small quantity of gasoline into the carburetor from an enclosed container while cranking the engine.

67. The most noticeable neglect of the transmission jack is the:

a. failure to clean the jack of spilt fluid.
b. damage incurred by banging the jack into place.
c. abuse of lifting too heavy objects.
d. none of the above.

68. The adjustable extension legs of the portable crane should be:

a. lengthened as far as possible.
b. lengthened out evenly.
c. adjusted with the top arm legthened further.
d. must be kept within one notch of each other.

69. To safely and effectively lift the front end of an average car, a jack should be used with a minumum rating of:

a. 2 ton.
b. 1/2 ton.
c. 5 ton.
d. 1 ton.

70. Of all uncleaned hand tools, the one which will have the most ill effect upon itself is:

a. sockets.
b. a speed handle.
c. a ratchet.
d. box-end wrenches.

71. Coolant temperature often reaches 260^0 F or more. Removing the radiator cap at this time:

a. may show a high coolant level.
b. could permit a small amount of coolant to be lost.
c. may allow coolant to flash (boil) and form a geyser at the radiator filler neck.
d. may allow air to enter the system and cause corrosion.

72. The gasoline tank:

a. should be repaired with the electric welder rather than gas to avoid an open flame.
b. should never be exposed to sparks, heat or open flames.
c. can be safely repaired with either arc or gas welding as long as proper eye protection is used.

73. When an observer notices a person without goggles utilizing a grinding machine, the observer should:

a. walk up beside and inform the person of the eye protecton rule.
b. come near enough to the worker and carefully remind him of the rule.
c. ignore the situation because he may endanger his own eyes if he comes near the worker.
d. report the situation to the supervisor when he meets the supervisor again rather than endanger himself in reminding the worker.

74. The most hazardous gas that usually build up in the shop is:

a. unburned hydro-carbons.
b. carbon dioxide.
c. carbon monoxide.
d. NO_x (oxides of nitrogen)

75. When a small fire occurs, the observer should:

a. report the fire to the supervisor.
b. utilize a fire extinguisher and have an assistant report the fire.
c. warn everyone quickly and evacuate the building.
d. clear the fire area and call the fire department.

76. Exit signs are:

a. all located over the doors to insure quick exit of the building in emergencies.
b. utilize only where there exists a good possibility of a fire.
c. necessary to facilitate easier exits of a building when leaving.

77. Twist drills are sharpened to the same cutting angle for all metals:

a. true.
b. false.

78. A single or double post frame lift requires that the left pads be:

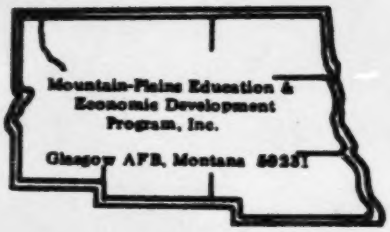
a. adjusted to match the frame.
b. adjusted to lift the center of the vehicle.
c. adjusted to lift the body evenly.
d. none of the above.

79. When lifting the car with a hoist:

a. lifting saddles must be properly located and in positive contact.
b. once saddles are located, apply some pressure, stop and examine them again before lifting the car.
c. watch for any side or overhead obstruction.
d. all of the above.

File Code: 37.01.01.00. B1-1

Date Published: 3/4/76



Learning Experience Guide

UNIT: SHOP SAFETY

RATIONALE:

Accidents in the shop area can injure mechanics. Most accidents can be avoided by performing work safely and using equipment with the proper precautions. An awareness of safety is an on-going process that is necessary for all work.

PREREQUISITES:

None

OBJECTIVE:

Use safety equipment and procedures properly.

RESOURCES:

Printed Materials

Auto Mechanics Fundamentals. Martin W. Stockel, Goodheart-Willcox Company, Inc.

Auto Service and Repair. Martin W. Stockel, Goodheart-Willcox Company, Inc.

First Aid Guide for U.S.D.A. Employees. Agriculture Handbook, No. 227, 1962.

Equipment

Exhaust hose.
Fire blanket.
Fire extinquishers.
First Aid Kit.
Gloves.
Goggles.
Jack stands.

Principal Author(s): C. Schramm & W. Osland

GENERAL INSTRUCTIONS:

This unit consists of four Learning Activity Packages (LAPs). Each LAP will provide specific information for completion of a learning activity.

The general procedure for this unit is as follows:

(1) Read the first assigned Learning Activity Package (LAP).
(2) Begin and complete the first assigned LAP.
(3) Take and score the LAP test.
(4) Turn in the LAP test answer sheet.
(5) Determine the reason for any missed items on the LAP test.
(6) Proceed to and complete the next assigned LAP in the unit.
(7) Complete all required LAPs for the unit by following steps 3 through 6.
(8) In this unit, there are some LAPs that have tests combined with other LAP tests. These combined tests are taken after completing the last LAP covered by the test.
(9) Take the unit tests as described in the Unit LEG "Evaluation Procedures".
(10) Proceed to the next assigned unit.

PERFORMANCE ACTIVITIES:

.01 Fundamentals of Shop Safety
.02 Safety with tools
.03 First Aid
.04 Shop Safety Observation

EVALUATION PROCEDURE:

Score 80% correct on the unit post test. There is no performance test for this unit.

FOLLOW-THROUGH:

Go to the first Learning Activity Package (LAP) listed on your SPR.

File Code: 37.01.01.01. B1-0

Date Published: 3/4/76

Mountain-Plains Education & Economic Development Program, Inc.
Glasgow AFB, Montana 59231

Learning Activity Package

Student: _____

Date: _____

PERFORMANCE ACTIVITY: Fundamentals of Shop Safety

OBJECTIVE:

Identify safety rules and procedures concerning shop injuries, damage, and dangerous shop conditions.

EVALUATION PROCEDURE:

Correctly answer 8 out of 10 items on a multiple-choice objective test.

RESOURCES:

Auto Mechanics Fundamentals, Stockel.

PROCEDURE:

1. To find the answers to the questions on the study guide "Fire and Personal Safety", read the following pages in Auto Mechanics Fundamentals: 84, 120, 126, 140, 179, 209, 294, 295, 305, 399, 334, 347 and 418.
2. Write the answers to the study guide on a separate sheet of paper.
3. Write your name and the date at the top of the answer sheet.
4. Read the attached supplement sheet "Fundamentals of Shop Safety".
5. Return the textbook Auto Mechanics Fundamentals.
6. Obtain a copy of the LAP test.
7. Complete the test and return the answer sheet.
8. If the score is less than 80%, review the material.
9. Upon successful completion, go to the next LAP.

Principal Author(s): J. Anderson
C. Schramm
W. Osland

SUPPLEMENT SHEET: FUNDAMENTALS OF SHOP SAFETY

I. General Shop Safety Rules

A. Fires

1. Obtain proper fire extinguisher.
2. Have someone notify supervisor or instructor.
3. Report fire to fire department.
4. Evacuate building if necessary.
5. Examine and record cause of the fire.
6. Always be alert to remove any existing fire possibilities.

B. Injuries (minor)

1. Notify the supervisor or instructor.
2. Clean and examine injury.
3. Have injury examined by doctor if necessary.
4. Fill out accident report form.

C. Carbon Monoxide Poisoning Prevention

1. Vehicles driven into the building must not be excessively idled or over-revved because this will cause a dangerous build-up of carbon monoxide which is hazardous to a person's respiratory system.

2. Vehicles operated in the shop during repairs must have an exhaust system in good shape which is attached to the shop exhaust removal system.

3. Vehicles over-revved while attached to the exhaust removel system will force the exhaust hoses off. Therefore, the repairman should always check to insure that the exhaust hoses are still properly attached.

D. Flammable Materials

1. All oily rags should be kept in metal containers.
2. Discarded fuels should be confined to a restricted area away from any flame or source of heat.
3. Oils should be sealed in a safe container when not in use.
4. Blowing solvent from a cleaned item should be done carefully and in a direction so the discarded solvent will not cause a potential hazard.

FUNDAMENTALS OF SHOP SAFETY (continued)

E. Additional Shop Rules

1. Horse play usually results in some minor or serious form of injury or equipment damage.

2. Goggles should be worn when operating grinding or power equipment to prevent possible loss of vision.

3. Spilled fluids or blocked walkways are often the major cause of falls and must be prevented to insure the safety of everyone.

4. Smoking should be done only in the designated area to insure the prevention of fire caused by flames near any flammable materials.

5. The best safety rule is always be alert and cautious when working in a hazardous situation.

Author's Name: Jim Anderson

STUDY GUIDE: FIRE AND PERSONAL SAFETY

REFERENCE: Auto Mechanics Fundamentals, pp. 84-418

1. How should you remove a radiator cap? (p. 84)

2. A gas tank, even when apparently empty, is very dangerous and can kill you. True or False? (p. 120)

3. What should you have in the shop and in your car as a precaution against fire? (p. 126)

4. What are four safety precautions you should take when priming a carburetor? (p. 140)

5. Engine_____and_____can be quite dangerous. (p. 179)

6. What should be done before you work on a clutch assembly in the car? (p. 209?)

7. What makes dismantling a front suspension system dangerous? (p. 294)

8. When working on the rear-axle assembly, what safety precaution should be taken? (p. 295)

9. When replacing a front-wheel hub, always install the_____washer and put in a new_____ _____. (p. 305)

10. Demountable rim_____are extremely dangerous. (p. 399)

11. Under no circumstances should you take a chance on a part if safety is involved. True or False? (p. 334)

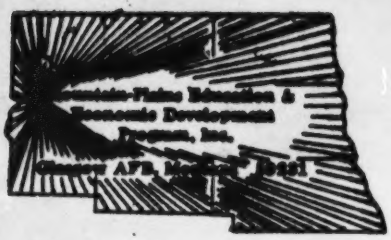
12. Why should only high quality brake fluid be used in the brake system? (p. 347)

13. If battery electrolyte gets into your eyes, what should you do? (p. 376)

14. Refrigerant-12 must be handled with_____care. (p. 418)

Author: _____ File Code: 37.01.01.01.B1-2

Date: _____ Date Published: 6-15-77



LAP TEST: FUNDAMENTALS OF SHOP SAFETY

1. Chips, shavings, and scraps are cleaned from benches and machinery with:

   a. a rag
   b. a paper towel
   c. a brush
   d. an air hose

2. Electrical fires should be extinguished using:

   a. soda acid
   b. water
   c. carbon dioxide
   d. a fire blanket

3. When an observer notices a person utilizing a grinding machine without goggles, the observer should:

   a. walk up beside and inform the person of the eye protection rule.
   b. come near enough to the worker and carefully remind him of the rule.
   c. ignore the situation because he may endanger his own eyes if he comes near the worker.
   d. report the situation to the supervisor when he meets the supervisor again rather than endanger himself in reminding the worker.

4. Eye protection may not be necessary when:

   a. changing the drill bit on an electric drill.
   b. hammering with or on hardened surfaces.
   c. using a valve grinder machine that utilizes an oil bath wash to catch the metal shavings.
   d. spraying with compressed air or fluids.

5. Fumes build-up in the shop is often due mostly to:

   a. unburnt hydro-carbons.
   b. carbon dioxide.
   c. carbon monoxide.
   d. toxic engine crankcase vapors.

6. When a small fire occurs, the observer should:

   a. report the fire to the supervisor.
   b. utilize a fire extinguisher and have an assistant report the fire.
   c. warn everyone quickly and evacuate the building.
   d. clear the fire area and call the fire department.

7. Oily rags are best confined:

   a. in metal container with a lid.
   b. in a disposable container.
   c. in an open trash receptical away from heat.
   d. on the toolroom shelf clear of any other articles.

8. Smoking is restricted to smoking area only:

   a. because of the fire hazard materials utilized in the shop.
   b. to prevent ashes from entering cleaned precision components.
   c. to prevent smoking workers from interferring with other workers.
   d. in order to properly keep a fire (if started) confined to one area.

9. Exit signs are:

   a. all located over the doors to insure quick exit of the building in emergencies.
   b. utilized only where there exists a good possibility of a fire.
   c. necessary for proper identification of building doors.
   d. necessary to facilitate easier exits of a building when leaving.

10. The exhaust piping and fan are necessary to:

   a. remove automobile fumes.
   b. control exhaust system noise.
   c. remove any exhaust back pressure buildup.
   d. remove toxic engine crankcase fumes.

LAP TEST ANSWER KEY: FUNDAMENTALS OF SHOP SAFETY

1. C
2. C
3. B
4. A
5. C
6. B
7. A
8. A
9. A
10. A

File Code: 37.01.01.02. B1-0

Date Published: 3/4/76

Mountain-Plains Education & Economic Development Program, Inc.
Glasgow AFB, Montana 59231

Learning Activity Package

Student: _____

Date: _____

PERFORMANCE ACTIVITY: Safety With Tools

OBJECTIVE:

Identify correct procedures for safe use of hand and power tools.

EVALUATION PROCEDURE:

Correctly answer 8 out of 10 items on a multiple-choice objective test.

RESOURCES:

Auto Mechanics Fundamentals, Stockel.

Auto Service and Repair, Stockel.

PROCEDURE:

1. To find the answers to the questions on the study guide "Hand Tool Safety", read pages 423-443 in Auto Mechanics Fundamentals.
2. Write the answers to the study guide on a separate sheet of paper.
3. Write your name and the date at the top of the answer sheet.
4. Study carefully the references to safety in Auto Service and Repair, Chapter 1, pages 1-7 to 1-24, and Chapter 2, pages 2-1 to 2-14.
5. Obtain a copy of the LAP test.
6. Complete the test and return the answer sheet.
7. If the score is less than 80%, review the material.
8. Upon successful completion, go to the next LAP.

Principal Author(s): C. Schramm
W. Osland

STUDY GUIDE: HAND TOOL SAFETY

REFERENCE: Auto Mechanics Fundamentals, pp. 425-447

1. What are two safety checks for a hammer? (p. 423)

2. The striking surface of a cold chisel should be _____ to reduce the danger of mushroom particles flying about. (p. 424)

3. When grinding and chipping with a chisel, you should wear _____. (p. 425)

4. Why should a file have a handle firmly affixed? (p. 425)

5. What are six safety hints to remember about drills and drilling? (p. 427)

6. Always wear _____ when using power grinders or wire wheels. (p. 431)

7. Small units should not be held in the palm of your hand when the force of the screwdriver is applied to the screw. True or False? (p. 433)

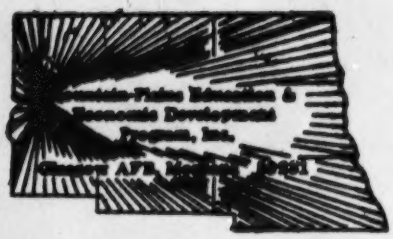
8. When working on electrical equipment, an _____screwdriver should be used. (p. 434)

9. When using wrenches, _____them to avoid smashing your fingers. (p. 434)

10. A six-point wrench is less likely to slip than a 12-point wrench. True or False? (p. 434)

Subject: _____ File Code: 37.01.01.02.B1-2

Date: _____ Date Published: 6-15-77



LAP TEST: SAFETY WITH TOOLS

1. For extra hand protection, a wooden handle is usually installed on a file part called the:

   a. heel
   b. tip
   c. edge
   d. tang

2. Before changing bit sizes in an electric drill:

   a. the electric power cord should be disconnected.
   b. the operator should secure the drill unit safely on a bench.
   c. the drill activator lock-button should be double checked.
   d. the operator should be away from any wet surfaces.

3. Electric operated wire brush (of a grinder) can be considered highly dangerous because of:

   a. the danger of jamming a part (being cleaned) into the wire wheel.
   b. the great possibility of the wheel coming loose.
   c. the flying dirt particles that come off the cleaned parts.
   d. the wire needles that can fly off the wheel.

4. Operating a screwdriver on a unit held in your hand can be considered dangerous because of the:

   a. possibility of dropping the unit and damaging it unnecessarily.
   b. possibility of slippage and piercing the hand with the screwdriver.
   c. units' sharp edges that may pierce the hand when pressure is applied.
   d. unsteadiness of the hand to effectively control the screwdriver.

5. Hand wrenches should be "pulled" instead of "pushing":

   a. to prevent unnecessary bolt-head damage.
   b. to use the wrench correctly because of its designed strength.
   c. to prevent hand injury if the wrench slips.
   d. because there is more strength application in this position.

6. All grinders must be equipped with a glass safety shield. The operators must also wear:

   a. gloves.
   b. an apron.
   c. eye protection.
   d. a cap.

7. Dislodging of a difficult bolt should be done with a:

   a. vice-grip.
   b. twelve-point socket.
   c. open-end wrench.
   d. six-point socket.

8. A worker operating a drill press or a drill should:

   a. not have any loose clothing.
   b. not operate the drill without a safety observer.
   c. wear gloves to protect his hands.
   d. contact the supervisor for approval.

9. The "crescent" wrench (or adjustable wrench) has one main disadvantage which is that:

   a. the jaws become warped easily under stress.
   b. it can only be used in one position.
   c. it is prone to loosening and slipping.
   d. it is not easily adjusted to size.

10. When installing a new stone on a power grinder make certain:

    a. it has the same grit rating as the old stones.
    b. it is designed to rotate in the proper direction.
    c. it has the proper balance weight for the grinder.
    d. it is designed for the RPM of the grinder.

LAP TEST ANSWER KEY: SAFETY WITH TOOLS

1. D
2. A
3. D
4. B
5. C
6. C
7. D
8. A
9. C
10. D

File Code: 37.01.01.03. B1-0

Date Published: 3/4/76

Mountain-Plains Education & Economic Development Program, Inc.
Glasgow AFB, Montana 59231

Learning Activity Package

Participant: _____

Date: _____

PERFORMANCE ACTIVITY: First Aid

OBJECTIVES:

Identify proper first aid procedures to follow in treating victims for shock, bleeding and burns.

Identify proper artificial respiration techniques.

EVALUATION PROCEDURE:

Correctly answer 8 out of 10 items on a multiple-choice objective test for this LAP and LAP 37.01.01.04.

RESOURCES:

First Aid Guide for U.S.D.A. Employees, Agriculture Handbook.

Telephone Directory.

PROCEDURE:

1. Read First Aid Guide for U.S.D.A. Employees.

   Key Point: Notice the procedures to follow for giving artificial respiration, and for treatment of bleeding and burns. These are situations that are encountered by most repairmen.

2. Using the telephone directory, find the telephone number for "Emergency".
3. Using the telephone directory, find the telephone number for "Ambulance".
4. Record emergency and ambulance phone numbers on the answer sheet.
5. Go to the next LAP.
6. The test for this LAP will be taken after completion of LAP 37.01.01.04.

Principal Author(s): C. Schramm & W. Osland

File Code: 37.01.01.04. 81-0

Date Published: 3/4/76

Mountain-Plains Education & Economic Development Program, Inc.
Glasgow AFB, Montana 59231

Learning Activity Package

Student: _____

Date: _____

PERFORMANCE ACTIVITY: Shop Safety Observation

OBJECTIVE:

Identify basic shop safety rules, equipment, and procedures in the shop area.

EVALUATION PROCEDURE:

Correctly answer 8 out of 10 items on a multiple-choice objective test for this LAP and LAP 37.01.01.03.

RESOURCES:

Exhaust hoses.
Fire blanket.
Fire extinguishers.
First Aid Kit.
Gloves.
Goggles.
Jack stand.

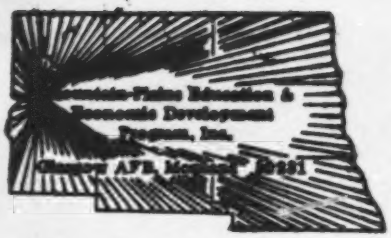
PROCEDURE:

1. Walk through the shop area and observe safety procedures and equipment.
2. Record your observations on paper.
3. Be sure to note eye and hand protectors for the machines in the shop.
4. Be sure to note the locations of fire extinquishers, fire blanket and First Aid Kit.
5. Record on paper any violations of shop safety rules, such as: students leaving spilled fluids, blocked passageways unattended, operating vehicles without exhaust removal system attached, working beneath a vehicle without jackstands.
6. Obtain a copy of the LAP test.
7. Complete the test and return the answer key.
8. If the score is less than 80%, review the material.
9. Upon completion, go to the next LAP.

Principal Author(s) J. Anderson, C. Schramm & W. Osland

Author: _____ File Code: 37.01.01.03.B1-2
37.01.01.04.B1-2

Date: _____ Date Published: 6-15-77



LAP TEST: FIRST AID AND SHOP SAFETY OBSERVATION

37.01.01.03

1. In first aid treatment for a cut artery you first:

   a. apply pressure at once.
   b. take patient to the hospital.
   c. wrap with sterile cloth.
   d. apply a constricting band.

2.

3. In treatment for an object embedded in the eye or surrounding tissues, do not let the victim:

   a. rub the eye.
   b. blink several times, if object is seen on the clear front part of the eye.
   c. pull down lower lid to remove object with clean handkerchief.
   d. grasp edge of upper lid, make slight pressure on the skin surface of the lid with the side of a blunt pencil or the edge of a match stick.

4. For prevention of a hernia you do not:

   a. twist when you lift.
   b. get firm footings and handholds when lifting.
   c. lift heavy objects with your back.
   d. keep back straight.

5. In the following situation who should be called first: (There is a fire; you find an injured person unconsious in the burning building):

   a. Police.
   b. Fire Department.
   c. Hospital.
   d. Ambulance.

37.01.01.04

6. Gasoline paints, solvents, and other materials that will burn are never to be used near:

   a. a work bench.
   b. a wooden building.
   c. an open flame.
   d. another student

37.01.01.04

7. Employees failing to utilize exhaust removal equipment on vehicles operated within the shop are:

   a. causing a potential fire hazard.
   b. only endangering themselves by working near the vehicle.
   c. not trying to eliminate excessive exhaust noise.
   d. endangering the shop people's respiratory systems.

8. The most often broken shop safety rule is the one requiring:

   a. no horseplay within the shop area.
   b. one to wear safety goggles when necessary.
   c. no smoking out of the designated work area.
   d. jackstands when a worker is beneath a vehicle.

9. Failure to replace shop equipment in its proper place will cause:

   a. loss of time to locate necessary equipment when needed.
   b. loss of valuable work space due to scattered equipment.
   c. both a and b above.
   d. extensive damage to equipment.

10. Overhead equipment poses an unexpected danger because:

   a. the equipment may fall on someone or something.
   b. a worker often doesn't watch what is overhead as he walks.
   c. it may not be designed to suspend over a long period of time.
   d. none of the above.

37.01.01.03.B1-2
37.01.01.04.B1-2

LAP TEST ANSWER KEY: FIRST AID AND SHOP SAFETY OBSERVATION

1. A
2.
3. A
4. C
5. B

LAP 04

6. C
7. D
8. B or C
9. C
10. B